

CLAIMS AS CURRENTLY PENDING

1. (Previously presented) A simulation system for simulating operation of an automotive vehicle, said simulation system comprising:

an input device for providing vehicle information and path information;

a controller coupled to said input device and operable to simulate said automotive vehicle using a vehicle computer model, wherein said controller is programmed to

determine a rear side slip angle of said vehicle computer model;

determine an initial steering wheel angle that is input to said vehicle computer model;

when said rear side slip angle is determined to be greater than a predetermined threshold, determine a look ahead scale factor and increase the distance of a look ahead point substantially on or near an intended vehicle path as a function of said look ahead scale factor;

determine a new steering wheel angle, which is input to said vehicle computer model at a time later than said initial steering wheel angle, by comparing said intended vehicle path with said look ahead point on or near said intended vehicle path;

operate said vehicle computer model with said initial steering wheel angle or said new steering wheel angle; and

generate an output in response to said vehicle computer model and said initial steering wheel angle or said new steering wheel angle.

2. (Previously presented) A simulation system as recited in claim 1, wherein said predetermined threshold is about 15 degrees.

3. (Previously presented) A simulation system as recited in claim 1, wherein said controller is programmed to determine both a longitudinal vehicle velocity and a lateral vehicle velocity and also determine said rear side slip angle as a function of said longitudinal vehicle velocity and said lateral vehicle velocity.

4. (Previously presented) A simulation system as recited in claim 1, wherein said controller is programmed to determine said look ahead scale factor as a function of said rear side slip angle.

5. (Previously presented) A simulation system as recited in claim 1, wherein said controller is programmed to determine said look ahead scale factor as a function of an exponential of said rear side slip angle.

6. (Previously presented) A simulation system as recited in claim 1, wherein said controller is programmed to determine said look ahead scale factor as a function of an exponential of a product of said rear side slip angle and a constant.

7. (Previously presented) A simulation system as recited in claim 6, wherein said constant is about 0.02.

8. (Previously presented) A simulation system as recited in claim 1, wherein said rear side slip angle is determined to not be greater than said predetermined threshold, said controller is alternatively programmed to determine an unscaled look ahead factor.

9. (Previously presented) A simulation system as recited in claim 1, wherein said controller is programmed to determine said new steering wheel angle when said vehicle computer model is determined to not be headed on target, and said target is associated with said intended vehicle path.

10. (Previously presented) A method of operating a vehicle computer model having vehicle information and path information therein, said method being operable on a digital computer system and comprising the steps of:

- (a) determining a rear side slip angle of said vehicle computer model;
- (b) determining an initial steering wheel angle that is input to said vehicle computer model;
- (c) when said rear side slip angle is determined to be greater than a predetermined threshold, determining a look ahead scale factor and increasing the distance of a look ahead point substantially on or near an intended vehicle path as a function of said look ahead scale factor;
- (d) determining a new steering wheel angle, which is input to said vehicle computer model at a time later than said initial steering wheel angle, by comparing said intended vehicle path with said look ahead point on or near said intended vehicle path;
- (e) operating said vehicle computer model with said initial steering wheel angle or said new steering wheel angle; and
- (f) generating an output in response to said vehicle computer model and said initial steering wheel angle or said new steering wheel angle.

11. (Previously presented) A method as recited in claim 10, wherein said predetermined threshold is about 15 degrees.

12. (Previously presented) A method as recited in claim 10, wherein step (a) is at least partially accomplished by determining both a longitudinal vehicle velocity and a lateral vehicle velocity and also determining said rear side slip angle as a function of said longitudinal vehicle velocity and said lateral vehicle velocity.

13. (Previously presented) A method as recited in claim 10, wherein said look ahead scale factor is determined as a function of said rear side slip angle.

14. (Previously presented) A method as recited in claim 10, wherein said look ahead scale factor is determined as a function of an exponential of said rear side slip angle.

15. (Previously presented) A method as recited in claim 10, wherein said look ahead scale factor is determined as a function of an exponential of a product of said rear side slip angle and a constant.

16. (Previously presented) A method as recited in claim 15, wherein said constant is about 0.02.

17. (Previously presented) A method as recited in claim 10, said method further comprising the step of when said rear side slip angle is determined to not be greater than said predetermined threshold, alternatively determining an unscaled look ahead factor.

18. (Previously presented) A method as recited in claim 10, said method further comprising the step of determining said new steering wheel angle when said vehicle computer model is determined to not be headed on target, said target being associated with said intended vehicle path.

19. (Previously presented) A method of operating a vehicle computer model having vehicle information and path information therein, said method comprising the steps of:

determining a rear side slip angle of said vehicle computer model;

determining an initial steering wheel angle that is input to said vehicle computer model;

determining a look ahead point that is substantially on or near an intended vehicle path for said vehicle computer model;

when said rear side slip angle is determined to be greater than a predetermined threshold, determining a look ahead scale factor and increasing the distance of said look ahead point as a function of said look ahead scale factor;

when said rear side slip angle is alternatively determined to be less than said predetermined threshold, maintaining the distance of said look ahead point;

when said vehicle computer model is determined to be headed off a predetermined target, determining a new steering wheel angle, which is input to said vehicle computer model, by comparing said intended vehicle path with said look ahead point on or near said intended vehicle path;

operating said vehicle computer model with said initial steering wheel angle or said new steering wheel angle; and

generating an output in response to said vehicle computer model and said initial steering wheel angel or said new steering wheel angle.

20. (Previously presented) A method as recited in claim 19, wherein said look ahead scale factor is determined as a function of an exponential of said rear side slip angle.